

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. APPLN. NO.: 10/632,919

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A compression bonding method in which an element, ~~which is formed of a material having a transparency with respect to at least a portion of the light spectrum,~~ is bonded to a substrate, the method comprising:

forming a layer having metal on at least a part of a surface of the substrate;

disposing the element on the layer; and

bonding the element to the layer by applying pressure on the element toward the layer and irradiating light to which the element is transparent, on a bonding area between the element and the layer, wherein the light provides activating energy which allows an interaction between the layer and the element approximately at room temperature.

2. (original): The method of claim 1, wherein the element is formed of silica glass.

3. (original): The method of claim 1, wherein the substrate is a silicon substrate.

4. (currently amended): A compression bonding method in which an element is bonded to a substrate, the method comprising:

forming a layer having metal on at least a part of a surface of the substrate;

disposing the element on the layer; and

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bonding the element to the layer by applying pressure on the element toward the layer and irradiating light to which the element is transparent, on a bonding area between the element and the layer~~The method of claim 1~~, wherein the light is irradiated on the bonding area for a predetermined time after the application of pressure.

5. (canceled).

6. (currently amended): The method of claim ~~5~~1, wherein the light has a wavelength of not less than approximately 180 nm.

7. (original): The method of claim 1, wherein the pressure, which acts at an interface between the layer and the element, ruptures a native oxide film on the layer and allows the element to contact a non-oxidized element of the layer.

8. (original): The method of claim 1, wherein the layer is a continuous layer.

9. (original): The method of claim 8, wherein a cross section of the element is round.

10. (original): The method of claim 8, wherein the element is an optical element that is one of a lens, an optical fiber, and a prism.

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11. (currently amended): A compression bonding method in which an element is bonded to a substrate, the method comprising:
forming a layer having metal on at least a part of a surface of the substrate;
disposing the element on the layer; and
bonding the element to the layer by applying pressure on the element toward the layer and irradiating light to which the element is transparent, on a bonding area between the element and the layer~~The method of claim 1~~, wherein the layer is a discontinuous layer.

12. (original): The method of claim 11, wherein the layer is formed as strips or dots.

13. (original): The method of claim 11, wherein a surface of the element which contacts the layer is substantially flat.

14 -16 (withdrawn).

17. (currently amended): A compression bonding method in which an element,~~which is formed of a material having a transparency with respect to at least a portion of the light spectrum~~ is bonded to a substrate, the method comprising:

forming a layer having metal, on at least a part of a surface of the substrate;
disposing the element on the layer;
applying pressure on the element toward the layer; and

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irradiating light to which the element is transparent, through the element to a bonding area between the element and the layer, wherein the light provides activating energy which allows an interaction between the layer and the element, approximately at room temperature.

18. (canceled).

19 - 20 (withdrawn).

21. (currently amended): A compression bonding method in which an element is bonded to a substrate, the method comprising:

forming a layer having metal on at least a part of a surface of the substrate;

disposing the element on the layer; and

bonding the element to the layer by applying pressure on the element toward the layer and irradiating light to which the element is transparent, on a bonding area between the element and the layer.
~~The method of claim 1,~~ wherein the light is substantially in the UV wavelength range.

22. (withdrawn)

23. (currently amended): A compression bonding method in which an element is bonded to a substrate, the method comprising:

forming a layer having metal, on at least a part of a surface of the substrate;

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disposing the element on the layer;
applying pressure on the element toward the layer; and
irradiating light to which the element is transparent, through the element to a bonding
area between the element and the layer. ~~The method of claim 17,~~ wherein the light is substantially
in the UV wavelength range.

24. (withdrawn)

25. (original): The method of claim 1, wherein the metal includes aluminum.

26. (original): The method of claim 7, wherein the non-oxidized element is
aluminum.

27. (original): The method of claim 17, wherein the metal includes aluminum.